

IN THE CLAIMS

1.-16. (Cancelled).

17. (Previously presented) An electrical coil and cooling system combination, comprising:

an electrical coil;

a heat dissipation device comprising a fluid and a tempered reservoir for said fluid;

a thermal coupling that interacts with said electrical coil to place said fluid in thermal communication therewith to dissipate heat from said electrical coil; and

said fluid flowing through said coupling and having a critical point for a temperature of said fluid and a pressure of said fluid, and said reservoir being temperature-regulated to maintain said fluid in immediate proximity of said critical point.

18. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil comprises a conductor having a conductor configuration, and wherein said coupling comprises a heat conducting tube in which said fluid flows that passes through said conductor configuration.

19. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil comprises a hollow conductor, forming said coupling, in which said fluid flows.

20. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil comprises a conductor, and wherein said coupling comprises a heat-insulating tube having a hollow tube interior in which said fluid flows and through which said conductor proceeds.

21. (Previously presented) A combination as claimed in claim 17 wherein said fluid is a fluid for which said critical point is approximately room temperature.

22. (Previously presented) A combination as claimed in claim 21 wherein said fluid is a fluid selected from the group consisting of CO₂ and C₂F₆.

23. (Previously presented) A combination as claimed in claim 17 comprising a heat exchanger in thermal communication with said reservoir to maintain said reservoir in said immediate proximity of said critical point of said fluid.

24. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil has a coil configuration forming a transverse gradient coil for a magnetic resonance tomography apparatus.

25. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil has a coil configuration forming an axial gradient coil for a magnetic resonance tomography apparatus.

26. (Previously presented) A combination as claimed in claim 17 wherein said electrical coil has a coil configuration forming a shim coil for a magnetic resonance tomography apparatus.

Claim 27 has been amended as follows:

27. (Currently amended) A magnetic resonance tomography apparatus comprising:

a magnetic resonance scanner adapted to interact with an examination subject to acquire magnetic resonance signals therefrom, said scanner comprising a magnet that generates a static basic magnetic field, at least one gradient coil that generates a gradient magnetic field, and shim iron that shims said static basic magnetic field;

a heat dissipation device comprising a fluid and a tempered reservoir for said fluid;

a coupling that thermally couples said fluid with at least one of said gradient coil and said shim iron; and

said fluid flowing through said coupling and having a critical point for a temperature of said fluid and a pressure of said fluid, and said reservoir

being temperature-regulated to maintain said fluid in immediate proximity of said critical point.

28. (Previously presented) A magnetic resonance tomography apparatus as claimed in claim 27 wherein said scanner has shim channels therein in which said shim iron is disposed, and wherein said coupling comprises a tube system in which said fluid flows, said tube system being in thermal communication with said shim channels.

29. (Previously presented) A magnetic resonance tomography apparatus as claimed in claim 27 wherein said fluid is a fluid having said critical temperature at approximately room temperature.

Claim 30 has been amended as follows:

30. (Currently amended) ~~22.~~ ~~(New)~~ A magnetic resonance tomography apparatus as claimed in claim 29 wherein said fluid is a fluid selected from the group consisting of CO₂ and C₂F₆.

31. (Previously presented) A magnetic resonance tomography apparatus as claimed in claim 27 comprising a heat exchanger in thermal communication with said reservoir to maintain said temperature and said pressure of said fluid in said immediate proximity of said critical point.